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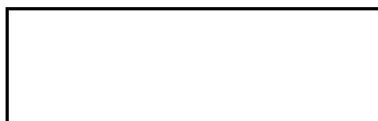
JAN 5 1967

Subject: PATENT DISCLOSURE LETTER
INDOANILINE BASED FILMS FOR
PHOTBLEACH PHOTOGRAPHY



25X

December 22, 1966



This disclosure pertains to a series of compositions for photosensitive films which show useful properties. Each of the details of the components of the compositions and of the behavior of the films, except for the specific dyes and polymer used, have been described in previous disclosures, particularly Docket 14D-2652. The present combination, however, is superior in many ways to any produced heretofore.

The materials discussed here have been described in detail in the final report, Photobleach Photography, Phase II, 30 November 1966. The film consists of a photosensitive layer coated on a support material. The photosensitive layer contains a dye, and a photosensitive agent dissolved or dispersed in a polymer. The dyes disclosed herein are

N, N, 2 trimethylindoaniline (TMI)
N, N diethyl 2-methylindoaniline (DEMI)
N, N dimethylindoaniline

These three dyes are closely related in structure to the previously disclosed indophenol blue. TMI and DEMI were discussed in the above mentioned report, while the dimethylindoaniline was ordered and obtained after the completion of the project. The photosensitizers used were iodoform and carbon tetrabromide. The polymer used was Eastman Alcohol Soluble Butyrate. The support material was a Mylar film. Coating was performed by a doctor knife.

The three dyes mentioned above are much more photosensitive than is indophenol blue in identical formulations using iodoform in ASB on Mylar. In all cases, exposures were used which produced barely visible bleaching. The film was

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Page 2, December 22, 1966

developed and fixed by heating, and the large difference in sensitivity became apparent after the heating process. Iodoform gives much greater photosensitivity than does carbon tetrabromide in these systems. Again, the difference is in the effect of the heating procedure on the film.

The effect of heat is more pronounced in films cast on Mylar than in those cast on glass substrates, presumably because of the greater heat capacity of the glass slide.

The above mentioned films are fully developed and fixed by exposure to 105° for eight minutes. They are sensitive only to light in the absorption band of the photosensitive agent, not of the dye. They can be illuminated for long periods of time without losing sensitivity or bleaching if a yellow filter such as Wratten #15 is used.

While the above films embody properties described in previous disclosures, they offer superior performance properties to any previous formulations.

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Notebook 52237, pgs. 34-74 (BV)
52173, pgs. 37 (MM)
52215, pg. 143 (RK)

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Subject: PATENT DOCKET DISCLOSURE
AZULENE AS A PHOTSENSITIVE MATERIAL

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December 23, 1966

JAN 6 1967

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Azulene is a hydrocarbon, an isomer of naphthalene, containing a five membered ring fused to a seven membered ring. It exhibits interesting photochemical properties when used in conjunction with iodoform or other photosensitive agents. A film made up with azulene and iodoform in polymer RJ-100 on glass, or in polysulfone polymer, is a light blue or green. On exposure to a tungsten or mercury lamp, the film darkens where exposed. The film is readily heat locked, and is relatively sensitive as compared to most dyes used in photobleach photography.

The significance of this disclosure is that azulene is not related to any of the materials previously disclosed as photosensitive dyes or dye formers. Very little work has been done on this system, and it seems to have the potential of being the basis for a useful system for making negative copies. Some of the derivatives of azulene can be expected to perform equally as well or better than azulene itself. Photosensitive agents other than iodoform can also be expected to work in this system.

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Notebook No. 51803, pgs. 114-5 (BV)
52173, pg. 31 (MM)

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Subject: PATENT DISCLOSURE LETTER
TEMPERATURE EFFECTS IN
PHOTBLEACH PHOTOGRAPHY

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December 23, 1966 25X

Ordinarily, rates of photochemical reactions are not dependent on temperature. More complex reactions, in which the first step is photochemical but subsequent steps are not, can be strongly dependent on temperature. If a photographic reaction, such as those of photobleach photography, falls in the latter class, then control of temperature can be used to control photographic sensitivity.

During the course of investigations of heat locking, some partially locked films were exposed to light while still warm and proved to be much more sensitive than expected. This led to experiments on the effect of temperature on sensitivity with similar results--the higher the temperature on exposure, the greater the sensitivity. This was demonstrated on films of Rose Bengal with iodoform, and indophenol blue with iodoform.

Another example of temperature effects is in the oven development of the TMI-iodoform system. Here, also, increase in temperature greatly increases the rate of conversion of the initial photoproduct to the final bleached form. A TMI-iodoform film which has been exposed normally but not heated will not develop a suitable image.

A combination of the two above effects should result in a film with superior sensitivity and convenience of handling. If a film is made in the normal way except that it is deposited on an electrically conductive substrate, and if the film is warmed immediately before exposure by a pulse of electrical energy, the exposure should be considerably shortened. Further electrical heating should provide for rapid fixing of the image.

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Notebook No. 51808, pgs. 128-131 (BV)
52173, pg. 31 (MM)

Read and understood _____ Date _____

JAN 5 1967

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Subject: PATENT DISCLOSURE LETTER
SEPARABLE FILMS FOR PHOTOBLEACH PHOTOGRAPHY

December 23, 1966

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In previous disclosures on Photobleach Photography, the photosensitive components have been dissolved or dispersed in a polymer permanently supported on a substrate. We have now found a polymer material which can act as a solvent for the photosensitive components, and which can be stripped from the surface of a glass support while remaining intact and retaining the image formed in it.

Union Carbide Bakelite Sulfone Resin 47, a polysulfone polymer, was used in these experiments. Using Rose Bengal and iodoforms, the film is relatively slow as compared to the same components in RJ-100 polymer. To separate the film from the glass substrate, the glass, immediately on removal from the heat-locking oven, is placed in cold water. The film thereupon separates very easily.

Other dyes and photosensitive agents could be used equally well. Undoubtedly, other polymers can be found with similar film-forming properties and with possibly superior dimensional stability.

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Notebook No. 51803, pgs. 96-103, 114-5 (BV)

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Subject: PATENT DISCLOSURE LETTER
EFFECT OF POLYMER IN
PHOTBLEACH PHOTOGRAPHY RECEIVED

JAN 5 1967 December 22, 1966

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In previous disclosure letters on dye photosensitivity, for example, Docket 14D-2652, the polymer used as a medium for containing the photosensitive materials acted solely as an inert binder which did not enter into the reaction and the chemical nature of which did not affect the rate of the reaction. The exceptions which have been noted are highly halogenated polymers which are structurally related to the photosensitive agents which have been used and which, therefore, can themselves act as photosensitive agents. In this disclosure we describe two polymers which are not halogenated but do increase the rate of photobleaching of particular dyes. The new polymers are Monsanto RJ-100, a copolymer of styrene and vinyl alcohol, and Eastman ASB, alcohol soluble butyrate. RJ-100 has been shown to increase the rate of bleaching of Rose Bengal and related dyes by a factor of at least four. Quantitative measurements were difficult to reproduce because a considerable portion of the bleaching occurred as a dark reaction after the end of the exposure period.

N, N, 2-trimethylindooaniline in ASB seemed qualitatively to be more sensitive than in RJ-100. However, no quantitative data are available for reaction rates in ASB.

The significance of this disclosure is that the binding medium for photobleach materials can now be treated as part of the photochemical system, if desired, and varied to impart optimum photochemical properties as well as optimum physical properties to the film.

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Notebook 51808, pgs. 38-39 (BV); 51913, pgs. 52-56 (GJH); 52215, pgs. 41-42 (RK)

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SPEED LETTER		REPLY REQUESTED		DATE 8-28-67
		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	LETTER NO. 1
TO : <i>N.D.C.</i>	FROM: <i>OSS/PD/OK</i>			
ATTN:				
<p><i>TO-2</i></p> <p><i>Attached copy of letter of 8-16-67 and five invention disclosures RDCD-1149, 1150, 1151, 1152 and 1161. Contractor is not going to file patent applications. Do you think Govt should undertake to patent.</i></p>				
<p><i>REPLY</i></p> <p><i>DATE 9/5/67</i></p> <p><i>It is felt there would be no benefit in the Government filing patent application on the submitted invention disclosures.</i></p>				
RESPONDER				

FORM 1831

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